इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 1889-4 (1979): Method for quantitative chemical analysis of binary mixtures of Regenerated Cellulose Fibres and Cotton, Part 4: Sulphuric acid Method [TXD 5: Chemical Methods of Test]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN
IGNORANTIA JURIS NON EXCUSAT
PROTECTED BY COPYRIGHT

IS : 1889 (Part IV) - 1979
(Reaffirmed 2005)
Edition 2.1
(1983-04)

Indian Standard

METHOD FOR QUANTITATIVE CHEMICAL ANALYSIS OF BINARY MIXTURES OF REGENERATED CELLULOSE FIBRES AND COTTON

PART IV SULPHURIC ACID METHOD

(First Revision)

(Incorporating Amendment No. 1)

UDC 677-16'461/463'21:677.014.6

© BIS 2003

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 2

Indian Standard

METHOD FOR QUANTITATIVE CHEMICAL ANALYSIS OF BINARY MIXTURES OF REGENERATED CELLULOSE FIBRES AND COTTON

PART IV SULPHURIC ACID METHOD

(First Revision)

Chemical Methods of Test Sectional Committee, TDC 5

Chairman	*Representing*
DR P. C. MEHTA	Ahmedabad Textile Industry's Research Association, Ahmadabad
Members	
DR V. G. AGNIHOTRI	National Peroxide Limited, Bombay
SHRI P. K. BASU	Directorate General of Supplies & Disposals, (Inspection Wing), New Delhi
SHRI A. K. SAIGAL (*Alternate*)	
SHRI M. L. BEHRANI	Ministry of Defence (R & D)
SHRI A. K. SINGH (*Alternate*)	
DR S. M. BETRABET	Cotton Technological Research Laboratory (ICAR), Bombay
DR S. N. PANDEY (*Alternate*)	
SHRI R. K. BHATNAGAR	Silk & Art Silk Mills' Association, Bombay
SHRI B. V. BHATT	Ahmedabad Manufacturing & Calico Printing Co Ltd, Ahmadabad
SHRI K. G. SHAH (*Alternate*)	
DR (KUMARI) M. D. BHAVSAR	The Silk & Art Silk Mills' Research Association, Bombay
SHRI B. B. CHAKRAVERTI	Superintendence Company of India (Private) Ltd, Calcutta
SHRI K. S DESIKAN	Office of the Textile Commissioner, Bombay
SHRI M. D. DIXIT	The Bombay Textile Research Association, Bombay
DR A. S. DUTT	Indian Jute Industries' Research Association, Calcutta
SHRI S. P. KAPUR	Ministry of Defence (DGI)
SHRI DESH RAJ YADAVA (*Alternate*)	

(*Continued on page* 2)

© BIS 2003

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
SHRI K. B. KULKARNI	Textile Auxiliaries Manufacturers' Association, Bombay
DR B. R. MANJUNATHA	Textiles Committee, Bombay
DR (SHRIMATI) G. R. PHALGUMANI (*Alternate*)	
SHRI S. S. MAVI	Directorate of Industries, Government of Punjab
SHRI N. S. SIDHU (*Alternate*)	
SHRI S. M. MISTRY	Association of Merchants & Manufacturers of Textile Stores & Machinery, India (Bombay)
SHRI R. S. PRAYAG	All India Handloom Board, Bombay
SHRI R. RAMAKRISHNAN	Binny Limited, Madras
SHRI K. G. KRISHNASWAMY (*Alternate*)	
REPRESENTATIVE	National Test House, Calcutta
SHRI N. S. SARAIYA	The Bombay Textile Research Association, Bombay
SHRI JAMNADAS K. SHAH	Raipur Manufacturing Co Ltd, Ahmadabad
SHRI K. M. SHAH	The Millowners' Association, Bombay
SHRI R. C. SHAH	Ahmedabad Textile Industry's Research Association, Ahmadabad
SHRI K. S. SRINIVASAN	Crescent Dyes & Chemicals Limited, Calcutta
SHRI R. S. BAJEKAL (*Alternate*)	
SHRI S. S. TRIVADI	Ahmedabad Textile Industry's Research Association, Ahmadabad
SHRI S. M. CHAKRABORTY, Director (Tex)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI D. R. KOHLI
Deputy Director (Tex), ISI

Identification and Analysis of Fibres and Fabrics Subcommittee, TDC 5 : 1

Convener	
SHRI N. S. SARAIYA	The Bombay Textile Research Association, Bombay
Members	
SHRI V. S. ANGADI	Sandoz (India) Limited, Bombay
SHRI K. S. RINDANI (*Alternate*)	
SHRI R. H. BENGIRI	The Bombay Dyeing & Manufacturing Co Ltd, Bombay
SHRI A. V. CHINIWALLA (*Alternate*)	
DR R. G. BOSE	Indian Jute Industries' Research Association, Calcutta
SHRI N. H. DESAI	Ahmedabad Textile Industry's Research Association, Ahmadabad
DR A. S. DIVETIA (*Alternate*)	
DR B. R. MANJUNATHA	Textiles Committee, Bombay
DR (SHRIMATI) G. R. PHALGUMANI (*Alternate*)	

(*Continued on page* 8)

Indian Standard

METHOD FOR QUANTITATIVE CHEMICAL ANALYSIS OF BINARY MIXTURES OF REGENERATED CELLULOSE FIBRES AND COTTON

PART IV SULPHURIC ACID METHOD

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part IV) (First Revision) was adopted by the Indian Standards Institution on 9 July 1979, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 This standard, first published in 1962 covered only sodium zincate method. While taking up the revision of the standard, the Committee decided to issue its revised version as Part I and to cover three more methods, namely; cadoxen solvent method, formic acid zinc chloride method and sulphuric acid method also as Parts II, III and IV of the standard respectively.

0.3 Two or more different types of fibres are mixed with one another for producing variety of textiles for different purposes. The use of different types of fibres in mixture has necessitated the formulation of standard methods, for identification and quantitative estimation of the fibres. Such an evaluation is of interest to the textile technologists, traders and consumers.

0.4 In the preparation of this standard (Parts I to IV) due weightage has been given to the test methods prevalent in the industry and trade and also the methods developed by International Organization for Standardization (ISO). Parts I and III are based mainly on ISO 1833-1977 'Textiles — Binary fibre mixtures — Quantitative chemical analysis'. Part II is based on the method developed by Prof W.B. Achwal of the University of Bombay (Department of Chemical Technology), Bombay and the extensive experiments carried out at the Ahmedabad Textile Industry's Research Association, Ahmadabad, the Bombay Textile Research Association, Bombay, and the Silk & Art Silk Mills' Research Association, Bombay. Part IV is based on the work done by the Textiles Committee, Bombay.

0.5 This edition 2.1 incorporates Amendment No. 1 (April 1983).

Amendment No. 1 is being carried out mainly to align the procedure given in this standard with the procedure given in IS : 6504-1979 Method for quantitative chemical analysis of ternary mixtures of viscose rayon, cotton and protein fibres (*first revision*). Side bar indicates modification of the text as the result of incorporation of the amendment.

0.6 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard (Part IV) prescribes sulphuric acid method for quantitative chemical analysis of binary mixtures of regenerated cellulose fibres and cotton in any textile form, such as fibre, yarn or fabric.

NOTE — Before conducting an analysis according to this method, the fibres present in the mixtures should be identified (*see* IS : 667-1955†) and the sample to be analysed shall be freed from all non-fibrous matter. Dye in the dyed fibres is considered to be an integral part of the fibre and is not to be removed.

1.1.1 This method is not applicable to mixtures in which the cotton has suffered extensive chemical degradation, nor when the viscose, cupro or modal fibre is rendered incompletely soluble by the presence of certain permanent finishes or reactive dyes that cannot be removed completely.

2. PRINCIPLE

2.1 A sample of the mixture is dried and weighed. The regenerated cellulose fibre is dissolved in sulphuric acid solution. The residue, that is cotton is collected, washed, dried and weighed. Then the proportion of regenerated cellulose and cotton is calculated.

3. SAMPLING

3.1 The quantity of textile material of definite type and quality delivered to one buyer against one despatch note shall constitute a lot.

3.1.1 If the textile material is fibre or yarn and the lot consists of more than 200 kg of fibre or yarn, it shall be divided into sub-lots each weighing 200 kg or less.

3.1.2 Each sub-lot shall be tested separately.

3.2 Sampling for Fibre and Yarn

3.2.1 From a sub-lot 15 increments, each weighing approximately 10 g, shall be taken from different parts and mixed thoroughly. This shall constitute a **test sample**.

---

*Rules for rounding off numerical values (*revised*).

†Simple methods for identification of common commercial textile fibres.

3.3 Sampling for Fabrics

3.3.1 The number of pieces to be selected shall be in accordance with Table 1. The pieces thus selected shall constitute a **gross sample**.

TABLE 1 SAMPLE SIZE

LOT SIZE	SAMPLE SIZE
Up to 100	3
101 to 300	4
301 to 500	5
501 and above	7

3.3.2 From each piece in the gross sample selected as in **3.3.1**, cut out small portions from at least two different parts weighing about 25 g. The parts selected shall be as representative as possible of the gross sample. In the case of fabrics with a definite repetition in weave pattern, the parts selected shall include all yarns in the complete pattern. Dissect the small portions of fabric thus collected into yarns and mix them thoroughly. This shall constitute a **test sample**.

4. APPARATUS

4.1 Sintered Glass Filter Crucibles — of appropriate capacity with pore size of 90 to 150 microns (porosity 1) and fitted with ground glass stoppers. If the stoppers are not available, the crucibles should be enclosed in weighing bottles for weighing.

4.2 Ventilated Oven — capable of maintaining a temperature of 105 ± 3°C.

4.3 Analytical Balance — of an accuracy of 0.000 2 g.

5. REAGENTS

5.0 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS : 1070-1977*) shall be used where the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

5.1 Sulphuric Acid Solution — Reagent grade, 60 percent (*m/m*) (specific gravity 1.493 at 27°C).

---

*Specification for water for general laboratory use (*second revision*).

5.2 Sulphuric Acid (Dilute Solution) — Reagent grade, 10 percent (*m*/*m*).

5.3 Ammonia (Dilute Solution) — 2 percent (*m*/*m*). 20 ml concentrated ammonium hydroxide (specific gravity 0.88) made up to one litre with water.

6. PREPARATION OF TEST SPECIMENS

6.1 From the sample **3.2** or **3.3**, after removing size and finishes as recommended in IS : 9068-1979* draw a representative specimen weighing about 2 to 3 g. Cut the test specimen into pieces of approximately 25 mm length and divide it into two.

7. PROCEDURE

7.1 Take a test specimen weighing about one gram from the pre-treated sample (*see* **6**). Cut the specimen to small pieces of about 2 mm length. Dry the specimen in a weighing bottle at 105 ± 3°C to constant mass and obtain the oven-dry mass of the specimen.

7.2 Dissolution of Viscose Rayon — Transfer the specimen to a flask containing 100 ml of sulphuric acid (60 percent) at room temperature, and stir vigorously to break up the sample completely at the first instant and then shake thoroughly, preferably with a mechanical shaker for 30 minutes. Transfer the contents of the flask to a weighed sintered glass crucible, wash the residue remaining in the flask, using a little more sulphuric acid solution, and transfer the contents to the crucible. Then wash the residue twice with a small quantity of dilute sulphuric acid solution followed by distilled water. Then wash the residue with dilute ammonia solution and finally wash the residue thoroughly with water. After each washing, drain the crucible with the aid of suction. Dry the residue to a constant mass in an oven at 105 ± 3°C, cool and weigh.

7.3 Similarly carry out the test on the other test specimen.

8. CALCULATION

8.1 Calculate the percentage of cotton fibre in each test specimen by the following formula and determine the average:

$$\text{Percentage of cotton} = \frac{100 \times M_r \times d}{M_s}$$

---

*Recommended methods for the removal of non-fibrous matter prior to quantitative analysis of fibre mixture.

where

M_r = mass of residue obtained in **7.2**,

d = correction factor for the loss in mass sustained by cotton during the analysis, and

M_s = mass of specimen obtained in **7.1**.

NOTE — The value of d is found to be 1.05.

8.2 Calculate the percentage of cotton fibres with percentage correction for moisture in each test specimen as given below:

$$P_M = \frac{100\ P\ (1 + 0.01\ a_2)}{P\ (1 + 0.1\ a_2) + (100 - P)\ (1 + 0.01\ a_1)}$$

where

P_M = percentage, by mass, of insoluble cotton with percentage additions for moisture;

P = percentage, by mass, of insoluble cotton on dry mass basis (*see* **8.1**);

a_1 = percentage addition to the soluble component for moisture; and

a_2 = percentage addition to the insoluble component for moisture.

NOTE — The moisture regain values for different textile fibres shall be as given below:

Raw cotton — 7 percent

Bleached/Mercerized cotton — 8.5 percent

Viscose/Polynosic — 11 percent

Cuprammonium — 11 percent

8.3 Determine the percentage of regenerated cellulose fibre by difference.

9. REPORT

9.1 The report shall include the following information:

a) Type of material,

b) Percentages of:

  1) regenerated cellulose,

  2) cotton, and

c) Number of specimens tested.

(*Continued from page* 2)

Members	*Representing*
SHRI S. K. MUKHERJEE	Woolcombers of India Ltd, Calcutta
SHRI M. R. PARANJAPE	The Silk & Art Silk Mills' Research Association, Bombay
SHRI R. R. SHANBAGH	Wool Research Association, Bombay
SHRI S. B. HARDAS (*Alternate*)	
SHRI D. K. SRIVASTAVA	Ministry of Defence (DGI)
SHRI K. R. BHANDARI (*Alternate*)	

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country

Copyright

BIS has the copyright of all its publications No part of these publications may be reproduced in any form without the prior permission in writing of BIS This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations Enquiries relating to copyright be addressed to the Director (Publications), BIS

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments Standards are also reviewed periodically, a standard along with amendments is reaffirmed when such review indicates that no changes are needed, if the review indicates that changes are needed, it is taken up for revision Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of BIS Catalogue' and Standards Monthly Additions'

This Indian Standard has been developed by Technical Committee TDC 5

Amendments Issued Since Publication

Amend No.	Date of Issue
Amd No 1	April 1983

BUREAU OF INDIAN STANDARDS

Headquarters

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones 323 01 31, 323 33 75, 323 94 02

Telegrams Manaksanstha
(Common to all offices)

Regional Offices		Telephone
Central	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17 323 38 41
Eastern	1/14 C I T Scheme VII M, V I P Road, Kankurgachi KOLKATA 700054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	C I T Campus, IV Cross Road, CHENNAI 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92
Branches	AHMEDABAD BANGALORE BHOPAL BHUBANESHWAR COIMBATORE FARIDABAD GHAZIABAD GUWAHATI HYDERABAD JAIPUR KANPUR LUCKNOW NAGPUR NALAGARH PATNA PUNE RAJKOT THIRUVANANTHAPURAM VISHAKHAPATNAM	